SYMONS'S
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METEOROLOGICAL MAGAZINE.

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The Rev. Charles Higman Griffith,

1830–96.

Now that our rainfall and meteorological correspondents number considerably over 3,000, it has become impossible to give obituary notices in these pages of any but those who have done exceptional work; and that certainly was the case with Mr. Griffith.

Although a naturalist and microscopist rather than a physicist, Mr. Griffith was always ready to help in any branch of meteorology, and besides keeping a full record, practically without a break, for a third of a century, he was always ready to undertake any necessary experiments. When Colonel Ward had concluded his observations on the relative indications of rain gauges of different sizes, and of similar sizes at different heights, the whole series was transferred to Strathfield Turgiss, and the little rectory and outbuildings were (as shown in the frontispiece to *British Rainfall*, 1868) appropriated to investigations on the effect of buildings on the amount indicated by gauges in bad positions. Later on he undertook the elaborate experiments upon the relative temperatures shown by thermometers mounted upon various patterns of thermometer stand, the mere recording of which was equivalent to the care of at least half-a-dozen ordinary meteorological stations. Lastly came the experiments upon evaporation with nearly two dozen different patterns, with records of the temperature of the water in each, and also in the river Loddon. The results of the automatic recorder attached to the tank, and the whole of the original observations, were placed in the hands of Mr. Rogers Field, C.E., in 1882 or 1883, but nothing has yet appeared from his pen, though fortunately the chief practical results, and several engravings of the instruments, were given in *British Rainfall*, 1889.

Mr. Griffith was a worker rather than a writer; had he written more. the parallelism between the two Hampshire rectors, Gilbert White of Selborne in the 18th century, and Griffith of Strathfield Turgiss in the 19th, would have been noteworthy.

GAUGING THE ATMOSPHERE.

WE have just been reading the paper* submitted to the Antwerp Conference by Signor Ventosa, Chief Astronomer at the Madrid Observatory, and wish to couple with a brief notice of it, reference to other somewhat analagous work.

Signor Ventosa has for many years been keeping a record of the direction and amount of the tremors on the edge of the sun, as seen through the large telescope of the Madrid Observatory, and he has tried, by throwing the sun out of focus, to ascertain the differences in the tremors at different heights in the atmosphere—*i.e.*, practically, he has focussed the telescope on layers of the atmosphere at different altitudes, and has obtained remarkably accordant results.—We must refer readers who are interested in the subject to his paper for details of this original and fascinating research.

We intimated above that other men have been labouring on this subject in directions which have much in common.

For years the variation in the scintillation of the stars has been associated with weather changes, and the late M. Montigny devoted much time and care to observations with his "scintillomètre."

Professor C. Zenger, of Prag, has devoted years to the study of small photographs of the sun taken (we believe) out of focus, and has published several works upon the utility of such photographs as indicators of coming weather.

The late Mr. Capron and others have been strong believers in the utility of the study of the Rain-band Spectroscope. And now we have Signor Ventosa's researches.

We should not be surprised if valuable discoveries were made at any observatory where all these methods were carried on at once.

A WET FEBRUARY IN MAURITIUS.

DR. MELDRUM has just sent us a short note as to the unprecedented rainfall in Mauritius in February, 1896.

At the Observatory the average fall for February is 7·15 inches; the total this year was 30·06 inches, or more than four times the average. Between 9 a.m. on February 19th and 10.25 a.m. on February 20th (25½ hours) there fell at the Observatory 17·34 inches.

The monthly totals at stations in the Upland district were equally unprecedented, and reached 40, 50, and even 55 inches.

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* *La direction des vents superieurs déterminée par les ondulations du bord des Astres.* 8vo, Antwerp, 1895.

ROYAL METEOROLOGICAL SOCIETY.

AT the monthly meeting of this Society on Wednesday evening, March 18th, Mr. E. Mawley (President), in the chair, Mr. Frederic Gaster, F.R.Met.Soc., of the Meteorological Office, delivered a Lecture on "Weather Forecasts and Storm Warnings, how they are prepared and made known," which was illustrated by instruments, diagrams, and numerous lantern slides.

Mr. Gaster said that in the preparation of forecasts, the position held by the barometer was so much more important than that of any other instrument, that its action must be fully comprehended if the rest of the work was to be at all clearly understood. The lecturer having fully explained this, referred to the use of a single isolated instrument, and showed what new light was given to the observer who could have telegraphed to him simultaneous observations from a large number of places scattered over a considerable area of the earth's surface. The variation in the distribution of pressure was dealt with, isobars were drawn, and the phenomena which they exhibit in the way of high and low pressure areas described. An explanation was given of the terms "cyclonic" and "anti-cyclonic," and the generally opposite characteristics of these two systems were stated. Mr. Gaster next drew attention to the obvious importance of the variation in the weather over a given area, caused by alterations in the position of the cyclonic and anticyclonic systems, and the importance of the fact that the former tended to move round the latter from left to right. This led to some remarks on the indications observed when disturbances were advancing towards our islands from different points. Attention was drawn to secondary systems, both of high and of low pressure, the forms they assume, and their effect on the weather which, but for their presence, would probably have accompanied their primaries; and the necessity for allowing for such systems in sending warnings to our coasts. The lecturer then remarked on the value of auxiliary information, such as that of decided changes in the direction of the wind, sudden changes of temperature, the movements of clouds at different levels, observations at high level stations, and telegrams from the United States.

Mr. Gaster next explained how the information is made known to the public. Forecasts are issued by the Meteorological Office in the Daily Weather Report, and also communicated to the Press, &c. Hay harvest forecasts are issued to certain selected authorities who circulate them as much as possible in their neighbourhood. Storm warnings are telegraphed to our coasts with instructions to hoist the cone—point up, when the gale is probable from points between north and east, and point down when from points between south and west. In conclusion, the lecturer drew attention to the marked improvement in these warnings in recent years, and to some of the occurrences which, from time to time, caused failures.

THE INDEX TO THE METEOROLOGICAL MAGAZINE.

I HAVE had many extremely kind letters respecting the above, but, although greatly obliged thereby, do not think it necessary to print them. As there are 360 numbers, and probably more than 20 entries will have to be made for each, *i.e.*, 7,200 entries, its appearance must not be expected for some months. *British Rainfall*, 1895, must come first, and the final revision of the Index will probably have to take the place of—or accompany—an autumn holiday.

G. J. SYMONS.

THE MILD WINTER.

To the Editor of the Meteorological Magazine.

SIR,—I have been so frequently asked whether the temperature of the past winter has not been unprecedentedly mild, that I give the following statistics to prove that such an impression is unfounded. During the last twenty-one years, there have been six milder winters recorded here, and it may be as well to mention that meteorologists consider the winter season to comprise the period from the first day of December in the one year to the last day of February in the next.

Mean Temperature of Mild Winters.

	1873-4.	1876-7.	1877-8.	1881-2.	1882-3.	1883-4.	1895-6.
Mean Temp....	39°·6	42°·0	39°·3	39°·0	39°·6	40°·0	38°·8
Above Mean...	2°·5	4°·9	2°·2	1°·9	2°·5	2°·9	1°·7

The mean temperature of winter here is 37°·1, so that the winter of 1895–96 has only been 1°·7 warmer than the average. It has been 3°·2 colder than that of 1876–77.

With respect to the rainfall, I may remark that although the amount for December was nearly an inch above the average, yet for January and February it did not amount to one-third of the average for those two months. The total rainfall for the three winter months was 6·20 inches, which is 3·27 inches below the average of 24 years.—I am, yours obediently,

C. LEESON PRINCE.

The Observatory, Crowborough Hill.

To the Editor of the Meteorological Magazine.

SIR,—In 1894 I wrote you (*Met. Mag.*, p. 18), showing reason why "we might expect the first quarter of 1896 or 1897 to have a very high mean temperature"; and I may be permitted (without posing in the mantle of a weather prophet) to refer to this in the light of recent experience. The mean temperature of last quarter, however, apparently falls a little short of 43°. Whether we shall have a fine, hot summer, as in the cases cited in my letter, remains to be seen.

Yours, &c.,

A. B. M.

THE AMERICAN METEOROLOGICAL JOURNAL.

WE are extremely sorry to hear that this ably conducted periodical will not appear after the present month.

Scarcely anything which money or brains could do, has been spared in order to ensure success, but we believe that from the first the publication has been unprofitable. How much has been lost, and who has borne it, we do not know. On this side of the Atlantic it is generally believed that during its long (12 years) and gallant fight for existence, the bulk of the expense has fallen upon Mr. Laurence Rotch, the founder, proprietor, and director of the Blue Hill Observatory. Of the merit of the twelve volumes of the American Meteorological Journal there cannot be two opinions, and we regret that the United States do not contain a sufficient number of meteorologists to support a monthly periodical.

The only gleam of brightness in the notice which we have received is that arrangements have been made with the editor of *Science* that a portion of that periodical shall be devoted to meteorology, and that Prof. R. de C. Ward, the present editor of the American Meteorological Journal, shall supervise it.

What interesting bits *Science* contains may be judged from the following portion of an article :—

THE METEOROLOGICAL STATIONS IN PERU ESTABLISHED BY HARVARD COLLEGE, U.S.A.

BY R. DE C. WARD.

The meteorological advantages for astronomical work in the region of Peru selected for occupation are very great. The temperature seldom falls below 40°, or rises above 75°. The rainy season is very short, and but little rain falls, generally less than four inches. November marks the beginning of the cloudy season ; December is fairly clear, and January to March are cloudy and rainy. During the rest of the year the atmosphere is very dry, and the sky prevailingly clear. In the rainy season it by no means rains every day, there being often a week or a fortnight during which no rain falls. The excessive dryness of the climate, in which vegetation is maintained only by constant irrigation, the short rainy season and the small amount of cloudiness combine to make this a very favourable region for astronomical work.

There are at present eight meteorological stations in Peru, maintained by the Harvard College Observatory. The principal one is at Arequipa, about 80 miles from the coast, and at an altitude of 8,050 feet above the sea. The city itself is situated in a little oasis formed by a river valley at the foot of the Cordillera, a little above the lower-lying desert. At Mollendo, on the sea-coast, there is a meteorological station 85 feet above sea level. Between Mollendo and the main station at Arequipa, another station has been established, at La Joya, about in the centre of a rainless, barren region, and at an elevation of 4,140 feet. The most interesting station of all is that on the summit of the volcano El Misti, 19,200 feet above the sea, lying north-east of Arequipa,

about ten miles distant. This station, established after much hardship and maintained with considerable difficulty, is now the highest meteorological station in the world. Mr. S. P. Fergusson, of Blue Hill Observatory, Massachusetts, has recently constructed a meteorograph for the Misti, which records automatically temperature, pressure, humidity, and wind direction and velocity, and will run three months without re-winding. The instrument will obviate the necessity of the frequent visits now made to the summit by the observers at Arequipa.

The other stations are as follows : Flank of El Misti, 15,700 feet, about the altitude of Mont Blanc ; Alto de los Huesos, 13,400 feet, a high desert plateau east of El Misti ; Cuzco, between the eastern and western Andes, 16,100 feet, and Santa Ana, east of the Andes, in the Urubamba Valley, 3,400 feet above the sea.

This continuous line of stations, reaching from the coast inland over 350 miles, and including such great altitudes as the summit and flank of El Misti, is equalled nowhere else in the world, and the results which the data there collected will furnish are certain to be of great importance to meteorology.—*Science*, New York, March 27th, 1896.

EARLY DAMAGE BY LIGHTNING IN 1896.

MARCH 4.—In the evening, a house struck at St. John's, Jersey ; chimneys overthrown and broke through the roof.

MARCH 4.—At night, St. Peter's House, Jersey, struck, and also a tree in the grounds. This may have been a multiple stroke, as several parts of the house and outbuildings, including a cow-house, were damaged.

MARCH 16.—About 7.30 a.m., house struck and chimneys demolished at Sunny Bank, Cragg Vale, Mytholmroyd, Yorks.

MARCH 24.—In evening, chimney struck at the "Jordan Arms," New Mills, Derbyshire, but little damage beyond stripping off the plaster.

MARCH 24.—About 9 p.m., a bricklayer, on attempting to open the garden gate of his house, at Northallerton, was struck by L, and his arm scorched.

MARCH 24.—About 3 p.m., an empty house at Mark Quay, Sunderland, struck, and a hole 15 ft. square made in the roof.

MARCH 25.—About 3 p.m. a stack at North Ormesby, near Middlesborough, was struck, and ignited.

MARCH 25.—Chimney of a draper's shop in Union Lane, Gateshead, struck, and knocked through the roof.

REVIEWS.

Etat actuel de nos connaissances sur l'Hydrométrie du Bassin de la Seine. par GEORGES LEMOINE, Ingénieur en chef des Ponts et Chaussées (Extrait des *Annales de Géographie*). Paris, Armand Collin and Cie, large 8vo, 21 pages, numerous diagrams and large coloured map.

LONDON is still waiting for what M. Belgrand did for Paris in 1854, and until a few more of our legislators appreciate what is understood in France by the expression Hydrométrie, there is little use in repeating that which we have often said, but which the authorities choose to ignore. It is immaterial to us; it is for those who suffer from floods to move, not for us.

This reads like a digression, but is the natural result of perusing the excellent narrative which M. Lemoine has given (in the above paper) of the work to which he has devoted the best years of his life, and which has been rewarded by most gratifying success. So much so, that now, not merely is the height to which every flood in Paris will rise predicted within a few inches, but there is a department under the Minister of Public Works branches of which announce with great precision the floods of the Saone at Chalon, of the Loire at Nevers and Orleans, and of the Garonne at Agen.

There is no one so competent to write upon the subject as M. Belgrand's old colleague and successor, and the paper by its clear expressions and statements, proves how thoroughly M. Lemoine has mastered the subject.

When shall we have any proper records of our British rivers?

Rapporto Annuale dell' Osservatorio Astronomico Meteorologico di Trieste . . . . . per l'anno 1893, redatto da ED. MAZELLE. Vol. X. Trieste, 1896, 4to, 114 pages.

THIS volume which is, we believe, in all respects conformable to the International rules, contains the records for the observatory at Trieste and for four stations in the immediate neighbourhood of that city, and for eight other stations distributed along the eastern shore of the Adriatic for about 300 miles south-east of Trieste, in fact down to the southern extremity of Dalmatia.

We are sorry to see that at several of the stations the rain gauges are on roofs. It seems strange that the inaccuracy of the records of instruments so placed is not generally recognised. At Trieste Observatory the rain gauge is stated to be 87 feet above the ground.

It is a pity that nowhere in the volume is there any comparison of the year to which it is devoted (1893) with previous years—nothing to show whether it was hotter. colder, drier, or wetter, than the average. Of course this could be ascertained by referring to previous volumes, but we think that a few pages devoted to the subject would be an improvement.

We are rather surprised to see only one temperature exceeding 93°, viz., 96°·3, at Punta d'Ostro, on July 2nd. Sharp frosts we expected to find, but scarcely a temperature of 17°·8 in Trieste, and of 5°·9 on the adjacent hills, but those are the records for January 14th, 1893.

The rainfall, considering the altitudes of the gauges and that the values are for only one year, 1893, are not to be accepted as more than approximate, but the following are the figures :—

Station.	N. Lat.	E. Lon.	Altitude	Height of Gauge above Ground.	Total Rain 1893.
	° ′	° ′	ft.	ft.	in.
Punta d'Ostro	42 27	18 34	210	13	27·1
Ragusa	42 38	18 7	80	36	77·7
Lissa (Semaphore)	43 5	16 14	79	26	17·9
Lesina	43 11	16 27	28	15	28·6
Lussin Grande	44 31	14 30	56	3	42·0
Lussin Piccolo	44 32	14 28	79	3	35·0
Pola	44 52	13 51	104	4	25·8
Fiume	45 19	14 27	16	10	53·8
Trieste	45 39	13 46	85	87	35·1
Basovizza	45 39	13 52	1220	5	46·5
Barcola	45 41	13 45	49	4	37·4
Opcina	45 41	13 47	1050	6	33·1

Annuaire pour l'an 1896 *publié par la Société Belge d'Astronomie.* Guide de l'amateur Astronome et Météorologiste. Bruxelles, Inst. Nat. de Géographie, 1896, small 8vo, 180 pages, numerous woodcuts and six plates.

THE young Belgian Astronomical Society has started boldly by preparing the present volume—which has many good features—for instance, on opening it we find apparently two loose plates, but we speedily find that they are duplicates of two given in the book, and that these (one of the size of solar spots, and the other a map of the moon) are specially intended for separate use.

We have often complained of the absurdity of February being two days too short while there is an unnecessary number of months with 31 days, but in this work there is an amusing all round attack on the calendar, summed up as follows :—

(1.) Absence of any definite relation between the days of the week and of the month. The years always begin on a different day of the week ; even in the same year each months begins, and *in no regular order*, with a different day of the week.

(2.) No regularity of sequence with months of 30 or 31 days, sometimes they alternate, sometimes they are consecutive.

(3.) Unreasonable shortness of February.

(4.) Inconvenience from a business point of view of the frequency with which the 1st and 15th of a month fall on a Sunday.

Then the writer takes up M. Armelin's proposal and shows how to get a simplified calendar, with all months of 30 or 31 days, running

in regular order, and with far less discord between the days of the week and of the month than exists at present.

Pages 51 to 63 contain a series of excellent suggestions as to the mode of observing and recording the magnitude, appearance and grouping of sun spots.

M. Vincent on pages 128–131 gives a short paper on the paths most frequently taken by barometric depressions, and on pages 132–138 he gives a series of instructions for the observation of clouds both as to their form and direction of motion. Lastly, Dr. Stroobant gives instructions for observing and recording the paths of shooting stars.

Sur la période de froid du 27 Janvier au 17 Février, 1895, par A. LANCASTER. [Extr. Bull. de l'Ac. roy de Belgique.] Brussels, 1895. 8vo. 12 pages, 1 map.

WE give a rough translation of the first two sentences of this paper, which will sufficiently indicate its style and nature :—

"We must go back to 1838, or nearly sixty years, to find a period comparable as regards cold with that which we have recently experienced. In 1838 the mean daily minimum from January 8th to 27th was (at Brussels) —13°·4 C (7°·9 F.), and the mean temperature —9°·8 C (14°·3 F.), or 11°·9 C (21°·4 F.) below the average. In 1895, from January 27th to February 17th, or 22 days, the mean minimum was —11°·0 C (12°·2 F.), and the mean temperature —6°·6 C (20°·1 F.), or 10°·1 C (18°·2 F.) below the average."

"The intensity of the cold was generally greater in 1838 than in 1895, but it was twice interrupted by the thermometer rising above freezing point, whereas in January and February, 1895, it remained below that point for 23 consecutive days. No such duration had before been recorded, and it renders the winter of 1894–5 as noteworthy as that of 1837–8."

M. Lancaster then proceeds to give an excellent narrative (with map and tables) of the 1895 frost, which in the high land S.E. of Brussels was very severe. We give the figures in Fahrenheit scale for four stations in that district, also the Brussels and London figures for comparison :—

Period—January 27th to February 17th.

Stations.	Altitude. Feet.	Mean Max.	Mean Min.	Mean of Extremes.	True Mean.	Absolute Min.
Beauplateau ...	1509	20°·5	—2°·9	8°·8	11°·1	—11°·6
Bastogne	1654	22·3	—4·0	9·1	11·5	—16 8
Libramont.....	1575	24·6	0·1	12·4	14·4	—14·8
Carlsbourg.....	1299	23·4	—1·5	10·9	13·1	—11·2
Mean of the above		22·7	—2·1	10·3	12·5	—10·6
Bruxelles		27·1	10·0	18·5	19·8	0·5
London		32·0	18·5	25·2	25·9	7·3
London warmer by		4·9	8·5	6·7	6·1	6·8

Therefore, much as Londoners grumbled at the frost, it was about 7° worse in Brussels, and about 15° worse on the hills S.E. of that city. Braemar was the only station in the British Isles to approach that district in severity, and Braemar was about 6° warmer.

Annuaire Météorologique pour 1893. Publié par l'Institut Royal Météorologique des Pays-Bas. Forty-fifth year. Utrecht, 1895, oblong 4to, xxxiv–370–xlix pages.

DR. SNELLEN is gradually getting his publication in accord with the rules of the International Committee—but we notice two respects in which we think that he is wrong.—We have often protested against the shortness of February, but until it is rectified by official and international agreement, we think it a mistake to introduce a period adopted by no one else, and to call it February. We are thoroughly with Dr. Snellen in wishing for the alteration, but we are sure that it is not wise to make a change before other civilized nations (or indeed we presume even Holland itself) have legally adopted it. Dr. Snellen's February consists of January 31st, February 1st to 28th, and March 1st. This, of course, gives three consecutive months of thirty days, but it leaves the two halves of the year with 181 and 184 days respectively.

The other practice to which we take exception is one in which we think that he is greatly improving, but he has still some tables in which the year begins with December 1st. We hope that this is the last volume in which we shall see that system adopted.

As regards the volume generally, we have for it nothing but praise. We should, however, like a little information as to the form of instruments used, and the mode of exposure; we note the serious differences of temperature at Utrecht, and the fact that the rain gauge there is 50 feet above the ground; if such can exist at the principal observatory, one becomes suspicious as to the second and third order stations.

There should be a map of the stations.

It would be better to develop the information on page v, by giving the latitude, longitude and altitude of each station.

Sur la distribution a Vienne et a Thorshavn, des éléments météorologiques autour des minima et des maxima barométriques, par A. AKERBLOM [Bihang till K. Svenska Vet.-Akad. Handlingar.] 8vo. Stockholm, 1895. 36 pages.

A CAREFULLY prepared paper, the nature of which is fully indicated by the title. The diagrams are extremely clear. In a short paper at the end upon the "Movements of Cirri over Cyclones and Anticyclones in Central Germany," M. Akerblom calls attention to a fact which we think has never been mentioned or referred to in these pages, viz., that the direction of the upper currents in Germany is independent of disturbances in the lower portions of the atmosphere, *i.e.*, that the cyclonic movements do not reach up to the cirri.

Klima-Tabeller for Norge. I. Luftens Temperatur af H. MOHN. [Vidensk. Skritter I. Math. naturv. Klasse.] Kristiania, 1895. Large 8vo, 27 pages.

THIS gives an epitome of the best records of the temperature of the air at Norwegian stations, corrected for secular variation and reduced to the mean of the 50 years, 1841–90. by comparison with the fluctuations at Christiania and Vardo. Values are given for 83 stations; of course, we cannot reproduce them all, and, unfortunately, the paper is not accompanied, as it very well might have been, by a map showing the position of the stations, and by a series of isothermal charts. We therefore shall give the values, converted into Fahrenheit's scale for the stations furthest N., E., S. and W. for the highest and lowest station, and for the hottest and coldest.

STATION.	Gjesvær.	Vardo.	Lindesnes.	Helliso.	Jerkin	Holmestrand.	Skudenes	Kontokeino.
Lat. N.	71° 6′	70° 22′	57° 59′	60° 45′	62° 14′	59° 29′	59° 9′	69° 0′
Lon. E.	25 22	31 8	7 3	4 43	9 35	10 19	5 16	23 3
Altitude (ft.)	*23*	*33*	*62*	*62*	*3160*	*10*	*13*	*866*
	°	°	°	°	°	°	°	°
January	25·3	21·9	33·3	36·5	17·2	26·8	35·8	5·9
February ...	24·3	20·8	32·0	35·2	17·2	26·6	34·5	5·5
March.....	25·9	23·2	34·0	36·0	20·5	30·2	35·8	10·4
April	30·4	28·8	40·5	41·0	27·0	39·7	41·5	20·8
May.....	36·9	34·5	48·0	46·4	36·7	49·6	47·7	35·2
June	44·4	42·1	55·0	52·0	46·8	59·0	53·8	47·1
July.....	50·0	47·5	59·2	55·8	49·5	62·1	57·0	53·4
August	50·7	48·6	59·5	55·8	48·7	60·3	57·9	51·1
September ..	43·9	43·3	54·9	53·4	41·4	52·7	54·3	40·5
October	35·6	34·7	46·9	46·8	31·1	43·2	47·3	25·5
November ...	29·1	27·9	39·6	40·6	21·7	34·0	40·8	13·6
December ...	26·2	24·1	34·9	37·4	17·2	28·2	37·0	6·3
Year	35·2	33·1	44·8	44·8	31·3	42·7	45·3	26·3
Max.	86·0	78·4	77·9	82·0	73·2	—	83·8	80·2
Min.	—3·1	—6·9	2·3	6·4	—21·3	—	5·5	—51·9

The temperature both monthly and annual for the South-Western stations, Lindesnes, Helliso and Skudenes remarkably resemble the values for Buxton, Derbyshire, as given by Mr. Bayard in *Quar.Jour. R.Met.Soc.*, xviii., 225.

Bulletin Mensuel de l'Observatoire Météorologique de l'Université d'Upsal. Année, 1895, par Dr. H. HILDEBRAND HILDEBRANDSSON. Upsal, small folio, 74 pp., 1895–96.

ANOTHER collection of tables, good in their way, but without a word of introduction, or description of the instruments or of their positions, and without a single figure relative to the relation of the values given in the book to those of previous years.

As this volume deals with 1895, we have taken out the figures for the same period as dealt with by M. Lancaster, and give the summary in exactly the same form as those on page 41—

Period—January 27th to February 17th, 1895.

Station.	Altitude. Feet.	Mean Max.	Mean Min.	Mean of Extremes	True Mean.	Absolute Min.
Upsala	...	16°0 ..	—0°4 ...	7°8 ...	9°1 ...	—19°1

This shows that Upsala was about 11° colder than Brussels and about 17° colder than London. It would be a comfort if we could either import some Upsala builders, or send some of ours over there. We should probably hear little afterwards respecting burst waterpipes *et id genus omne*.

Beiträge zur Kentniss des tropischen Regens, von J. Wiesner. [Sitzungsb. d. k. Ak. d. Wissens in Wien]. 8vo, Vienna, 1895, 38 pages.

Herr Wiesner spent part of 1893 and 1894 at Buitenzorg in Java, occupied chiefly with botanical researches, part of which led to his studying the mechanical effect of rain on plants and flowers. As the mean yearly rainfall at Buitenzorg is 176 inches, almost exactly that at The Stye, it was evidently a suitable place for his research.

If, as we presume, Herr Wiesner is a botanist, it is rather strange that he should be, as we think that he is, the first to give us details of tropical rains. Millions of observations of rainfall have been made in the tropics, and yearly means are available for probably 1,000 stations, but for details of hourly or minutely fall, the search would be a weary and nearly profitless one.

Herr Wiesner put up a 12-inch glass funnel to collect the rain and ran it into a calibrated tube, reading off the time by a stop watch, and he also made observations by ascertaining the area of porous paper wetted by respective raindrops. He seems somewhat unhappy at discord between his record and that by the local observer, but as Herr Wiesner took no observations at night, and his "day" began at 6 a.m., agreement would be impossible.

He gives details for nine rains and we extract the heaviest :—

			Total. in.	Rate per hour. in.
(1) 1893.....	Dec. 9.....	2.40 to 2.50 p.m.	0·04	0·22
(2) ,, ...	,, 13.....	3.5 to 3.10 p.m.	0·02	·18
(3) ,, ...	,, 16.....	8.57 to 9.2 a.m.	0·07	·87
(4) ,, ...	,, 23.....	About 3 p.m.	—	1·24
(5) ,, ...	,, 25.....	,, ,, ...	—	3·91
(6) ,, ...	,, 27.....	,, 5 p.m.	— ...	·12
(7) 1894.....	Jan. 6.....	7.12 to 7.24 a.m.	0·03	·29
(8) ,, ...	,, 8	7.26 to 7.33 a.m.	0·004	·05
(9) ,, ...	,, 8.....	About noon.....	—	5·36

Unfortunately measurements (4) to (6) and (9) do not give duration, which is all-important; but as far as we can ascertain, none of these measurements approach the intensity observed at Camden Square in 1878, when [*Brit. Rain.*, 1878, p. 79] we had—

Time.	Total. in.	Rate per hour. in.	Time.	Total. in.	Rate per hour. in.
30 seconds ...	·10 ...	12·00	3 minutes.....	·40 ...	8·00
1 minute	·17 ...	10·20	4 ,, ...	·47 ...	7·05
2 ,, ...	·32 ...	9·60	5 ,, ...	·56 ..	6·72

SUPPLEMENTARY TABLE OF RAINFALL, MARCH, 1896.

[For the Counties, Latitudes, and Longitudes of most of these Stations, see *Met. Mag.*, Vol. XIV., pp. 10 & 11.]

Div.	STATION.	Total Rain.	Div.	STATION.	Total Rain.
		in.			in.
II.	Dorking, Abinger Hall .	3·69	XI.	Lake Vyrnwy	7·62
,,	Birchington, Thor	1·85	,,	Corwen, Rhug	4·41
,,	Hailsham	2·80	,,	Carnarvon, Cocksidia ...	...
,,	Ryde, Thornbrough	3·35	,,	I. of Man, Douglas	4·17
,,	Emsworth, Redlands ...	3·26	XII.	Stoneykirk, Ardwell Ho.	2·84
,,	Alton, Ashdell	4·32	,,	New Galloway, Glenlee	7·85
III.	Oxford, Magdalen Col..	2·32	,,	Lilliesleaf, Riddell	2·56
,,	Banbury, Bloxham	2·32	XIII.	N. Esk Res. [Penicuick]	2·95
,,	Northampton, Sedgebrook	2·70	,,	Edinburgh, Blacket Pl..	1·59
,,	Alconbury	1·98	XIV.	Glasgow, Queen's Park..	4·21
,,	Wisbech, Bank House...	2·57	XV.	Inverary, Newtown	10·22
IV.	Southend	2·62	,,	Oban, The Corran	8·45
,,	Harlow, Sheering..... ...	3·72	,,	Islay, Gruinart Schools..	7·05
,,	Colchester, Lexden	2·77	XVI.	Dollar.....	4·53
,,	Rendlesham Hall	2·82	,,	Balquhidder, Stronvar...	8·79
,,	Diss	...	,,	Ballinluig	2·30
,,	Swaffham	3·73	,,	Dalnaspidal H.R.S.....	6·26
V.	Salisbury, Alderbury ...	3·59	XVII.	Keith H.R.S.....	2·50
,,	Bishop's Cannings	3·58	,,	Forres H.R.S.	..
,,	Blandford, Whatcombe .	3·78	XVIII.	Fearn, Lower Pitkerrie..	1·20
,,	Ashburton, Holne Vic...	8·03	,,	N. Uist, Loch Maddy ...	6·42
,,	Okehampton, Oaklands.	5·45	,,	Invergarry.....	9·01
,,	Hartland Abbey	3·05	,,	Aviemore H.R.S.	3·00
,,	Lynmouth, Glenthorne.	4·83	,,	Loch Ness, Drumnadrochit	3·30
,,	Probus, Lamellyn	3·15	XIX.	Invershin	2·95
,,	Wellington, The Avenue	3·11	,,	Scourie	5·25
,,	Wincanton, Stowell Rec.	3·85	,,	Watten H.R.S.....	2·99
VI.	Clifton, Pembroke Road	3·40	XX.	Dunmanway, Coolkelure	7·00
,,	Ross, The Graig	2·24	,,	Cork, Wellesley Terrace	2·84
,,	Wem, Clive Vicarage ...	2·39	,,	Killarney, Woodlawn ...	6·54
,,	Cheadle, The Heath Ho.	3·94	,,	Caher, Duneske	3·50
,,	Worcester, Diglis Lock	2·31	,,	Ballingarry, Hazelfort...	4·11
,,	Coventry, Coundon	2·26	,,	Limerick, Kilcornan ...	4·54
VII.	Ketton Hall [Stamford]	2·08	,,	Ennis.....	...
,,	Grantham, Stainby	1·67	,,	Miltown Malbay	6·74
,,	Horncastle, Bucknall ...	2·19	XXI.	Gorey, Courtown House	2·22
,,	Worksop, Hodsck Priory	1·76	,,	Athlone, Twyford	4·69
VIII.	Neston, Hinderton	3·06	,,	Mullingar, Belvedere ...	5·44
,,	Southport, Hesketh Park	3·63	,,	Longford, Currygrane...	4·30
,,	Broughton-in-Furness ...	7·37	XXII.	Woodlawn	4·75
IX.	Ripon, Mickley.....	3·12	,,	Crossmolina, Enniscoe ..	6·90
,,	Melmerby, Baldersby ...	2·41	,,	Collooney, Markree Obs.	5·41
,,	Scarborough, Obs.	2·42	,,	Ballinamore, Lawderdale	6·01
,,	Middleton, Mickleton ...	3·68	XXIII.	Lough Sheelin, Arley...	4·48
X.	Haltwhistle, Unthank...	4·73	,,	Warrenpoint.....	4·53
,,	Bamburgh	1·84	,,	Seaforde..	3·43
,,	Keswick, The Bank.....	7·96	,,	Belfast, Springfield	4·99
XI.	Llanfrechfa Grange	4·33	,,	Bushmills, Dundarave..	3·54
,,	Llandovery	5·40	,,	Stewartstown	3·77
,,	Castle Malgwyn	4·18	,,	Killybegs	8·65
,,	Builth, Abergwesyn Vic.	10·39	,,	Lough Swilly, Carrablagh	6·22
,,	Rhayader, Nantgwillt ...	8·00			

MARCH, 1896.

Div.		STATIONS. [The Roman numerals denote the division of the Annual Tables to which each station belongs.]	RAINFALL. Total Fall.	Difference from average 1880-9.	Greatest Fall in 24 hours. Dpth	Date	Days on which ·01 or more fell.	TEMPERATURE. Max. Deg.	Date	Min. Deg.	Date.	No. of Nights below 32° In Shade.	On grass.
			inches.	inches.	in.								
I.	ENGLAND.	London (Camden Square) ...	3·20	+ 1·59	·53	17	25	65·2	22	29·4	15	2	12
II.		Maidstone (Hunton Court)...	2·11	+ ·61	·41	7	10	...	...	...	...	...	...
,,		Strathfield Turgiss	...	...	...	...	...	...	...	...	...	...	...
III.		Hitchin	3·08	+ 1·74	·46	20	28	63·0	22	30·0	14*d*	6	...
,,		Winslow (Addington)	2·50	+ ·78	·50	17	26	64·0	22*a*	26·0	15	6	12
IV.		Bury St. Edmunds (Westley)	3·78	+ 2·23	·64	17	26	60·0	22	32·0	13*e*	2	...
,,		Norwich (Brundall)	3·02	...	·55	28	26	65·6	22	29·2	13	4	12
V.		Weymouth(LangtonHerring)	2·72	+ ·82	·66	17	26	59·0	22	32·0	30	1	...
,,		Torquay (Cary Green)	3·42	...	·62	20	23	57·1	11	34·0	4	0	4
,,		Polapit Tamar [Launceston]..	4·69	+ 2·16	·91	7	23	58·0	23	26·8	19	3	3
VI.		Stroud (Upfield)	2·71	+ ·52	·33	2, 17	23	62·0	24	32·0	18*f*	3	...
,,		ChurchStretton(Woolstaston)	3·09	+ ·96	·41	2	24	61·0	24	31·0	30	4	15
,,		Tenbury (Orleton)	3·12	+ 1·04	·61	20	23	63·0	24	27·2	19	5	5
VII.		Leicester (Barkby)	2·03	+ ·32	·30	7	28	65·0	24	22·0	30	10	22
,,		Boston	1·98	+ ·44	·30	20*h*	18	65·0	23	30·0	10	2	...
,,		Hesley Hall [Tickhill].....	1·55	— ·35	·33	13	16	67·0	27	26·0	31	7	...
VIII.		Manchester(PlymouthGrove)	3·89	+ 1·67	·76	7	23	59·0	24	29·0	18	3	0
IX.		Wetherby (Ribston Hall) ...	2·37	+ ·31	·53	13	11	...	...	...	...	...	...
,,		Skipton (Arncliffe)	9·87	+ 4·77	1·44	2	24	..	...	...	...	...	...
,,		Hull (Pearson Park).	2·40	+ ·35	·75	13	20	65·0	25	25·0	13	9	12
X.		Newcastle (Town Moor)	2·45	— ·18	90	13	16	...	...	...	...	...	...
,,		Borrowdale (Seathwaite).....	19·28	+ 8·78	2·07	2	24	...	...	...	...	...	...
XI.	WALES.	Cardiff (Ely).....	5·25	+ 2·27	·65	7	28	...	...	...	...	...	...
,,		Haverfordwest	3·62	+ ·38	·49	6	29	55·7	25	27·8	19	1	10
,,		Aberystwith (Gogerddan) ...	5·85	+ 2·87	1·82	7	27	60·0	24	...	...	...	...
,,		Llandudno.....	4·11	+ 2·03	·83	7	23	55·5	17	33·4	15	0	...
XII.	SCOTLAND.	Cargen [Dumfries]	4·56	+ 1·26	·64	2	19	55·0	25	28·0	19*e*	7	...
,,		Jedburgh (Sunnyside).....	2·70	+ ·74	·50	21	14	59·0	25	26·0	12*g*	11	...
XIV.		Colmonell	5·03	...	·64	7	22	59·0	22*b*	27·0	18*h*	...	...
XV.		Lochgilphead (Kilmory)	8·78	+ 4·32	1·25	7	28	...	...	24·0	3	10	...
,,		Mull (Quinish).....	7·47	+ 3·63	·85	7	27	...	...	...	...	...	...
XVI.		Loch Leven Sluices	2·90	— ·07	·50	3, 4	15	...	...	...	...	...	...
,,		Dundee (Eastern Necropolis)	1·15	— 1·25	·20	15	16	57·0	31	27·3	4	9	...
XVII.		Braemar	2·33	— ·31	·32	19	20	54·1	25	23·0	30	16	25
,,		Aberdeen (Cranford)	2·30	...	·40	7	23	58·0	31	24·0	3	11	..
XVIII		Strathconan [Beauly]	8·10	+ 3·78	1·54	2	18	...	...	...	...	...	...
,,		Glencarron Lodge.....	11·79	...	1·15	24	28	54 0	25	25·0	14	13	...
,,		Cawdor [Nairn]	2·22	+ ·18	·37	5	17	...	...	...	...	...	...
XIX.		Dunrobin	2·82	+ ·57	·42	10	21	56·0	31	28·8	14	9	...
,,		S. Ronaldsay (Roeberry).....	3·09	+ ·55	·37	15	24	53·0	25	30·0	7, 13	5	...
XX.	IRELAND.	Darrynane Abbey.....	5·58	...	·70	3	29	...	...	...	...	...	...
,,		Waterford (Brook Lodge) ...	2·36	— ·54	·25	26	24	58·0	7*c*	30·0	19	3	...
,,		O'Briensbridge (Ross)	5·01	...	·51	7	22	..	...	...	...	...	...
XXI.		Carlow (Browne's Hill)	...	...	.	..	...	...	..	...	...	...	...
,,		Dublin (FitzWilliam Square)	3·31	+ 1·30	·50	17	23	58·5	24	34·1	27	0	8
XXII.		Ballinasloe	4·37	+ 1·74	·59	3	28	55·0	9, 24	29·0	19	7	...
,,		Clifden (Kylemore)	9·76	...	1·39	23	30	...	...	...	...	...	...
XXIII		Waringstown	3·42	+ 1·07	·45	2	23	60·0	24*b*	28·0	18*i*	13	19
,,		Londonderry (Creggan Res.).	5·32	+ 2·59	·68	3	27	...	...	...	...	...	...
,,		Omagh (Edenfel)	4·36	+ 1·85	·66	7	26	54·0	8, 22	28·0	18	6	17

+Shows that the fall was above the average ; —that it was below it.

a—and 24. *b*—and 25. *c*—and 8, 11, 22. *d*—and 18, 29. *e*—and 30. *f*—and 29, 30. *g*—and 28. *h*—and 29. *i*—and 26.

METEOROLOGICAL NOTES ON MARCH, 1896.

ABBREVIATIONS.—Bar. for Barometer; Ther. for Thermometer; Max. for Maximum; Min. for Minimum; T for Thunder; L for Lightning; T S for Thunderstorm; R for Rain; H for Hail; S for Snow.

ENGLAND.

HITCHIN.—The wettest March since 1851, with the greatest number of wet days ever recorded.

ADDINGTON.—The rainfall has been only twice exceeded during 25 years, and no other March has had rain on so many days. On the 4th the bar. was unusually low, 28·783 in. (cor. and red.) at 9 a.m. Dense fog on the morning of 23rd. S showers and L on 3rd. T on 22nd. H, S and sleet on 28th and 29th.

BURY ST. EDMUNDS, WESTLEY.—The wettest month of March registered since observations commenced on January 1st, 1857. March, 1888, 3·35 in. and March, 1890, 3·06 in. are the only other instances with more than three inches. A mild month. Vegetation very forward. T on 4th. TS on 22nd.

NORWICH, BRUNDALL.—The mildest March since 1882, and the wettest since 1888, when the month's total was nearly the same. At the close of the month vegetation was not so forward as in 1882, when there was more sunshine. S.W. gales on 3rd, 6th and 16th, and N.W. on 27th. H on 4th, 5th, 16th and 29th. Severe but distant TS on evening of 22nd. Slight distant TS on evening of 24th. Solar halo on 26th.

WEYMOUTH, LANGTON HERRING.—The mean temp. at 9 a.m., 46°·2, is the highest of the last 25 Marches, and 4°·6 above the average. Very strong gales blew on the 2nd, 3rd and 4th, and again on the 26th. Solo halos were observed on the 10th and 26th. Fogs on the 7th and 17th. Rainfall of the first 3 months of the year 4·18 in., or 61 per cent. of the average.

TORQUAY, CARY GREEN.—Rainfall 1·05 in. above the average. Mean temp. 47°·8, or 4°·1 above the average. Duration of sunshine 117 hours 20 minutes, being 32 hours below the average; 3 sunless days.

POLAPIT TAMAR [LAUNCESTON].—Generaly warm, but rough and stormy, and unusually free from cold east winds. A very wet month, the total being the highest for March during 16 years, the previous highest being in 1888, when 4·53 in. fell. H, S and T on 3rd. H on 4th. Thick fog early on 23rd. Stormy with H on 26th, 27th and 28th.

STROUD, UPFIELD.—T and L between 4 and 5 a.m. on 2nd; L seen at 6 p.m. on 24th. S.W. gales on 3rd, 14th and 26th.; N.W. gale on 15th. Slight S shower on 29th.

WOOLSTASTON.—A stormy month, with constant scuds of S and H; a wild gale on the night of the 2nd. Mean temp. 44°·4.

TENBURY, ORLETON.—A very warm, damp month. The warmest March, with the exception of 1868, in the last 35 years, and the wettest since 1886. Mean temp. nearly 4° above the average. Chiffchaff heard on the 19th. Cherry, plum and damson trees coming into blossom at the end of the month. S on the 13th and 16th. T and L on 24th. Aurora borealis on the 4th.

LEICESTER, BARKBY.—Considerable wind at times. R every day but three. Mean temp. 43°·1.

MANCHESTER, PLYMOUTH GROVE.—Very mild for the season, and no cold easterly winds. The rainfall is the greatest in March for 29 years. Thick fog on 23rd and 25th. On the 24th a beautiful display of sheet lightning. On the 28th a slight fall of S. Mean temp. 45°.

WALES.

HAVERFORDWEST.—Another month of constant R, although the quantities were small. The month commenced with boisterous weather and heavy gales, with the barometer below 29 inches for more than 36 hours, the gale lasting a week. The month throughout was mild for March, with only one night of frost

in the screen. The last week was very stormy and colder; the last two days calm and fine. Blackthorn in full blossom, chestnut almost in full leaf, hedgerows quite green. Trees of every kind very forward; every appearance of a very early spring.

ABERYSTWITH, GOGERDDAN.—Very wet throughout the month and very mild, but very little sunshine.

SCOTLAND.

CARGEN [DUMFRIES].—Constant atmospheric changes have been the order of the month, but cloudy unsettled weather generally prevailed. Bar. pressure has been very fluctuating, and the mean for the month 29·556 in. has only in four years been lower since 1860. Temp. is 1°·6 above the average, the lowest reading 28° being the highest minimum in this month since 1882, when frost was never registered. L was seen on the night of 3rd; an inch of S fell on 14th; brilliant aurora was seen on 29th. Westerly wind prevailed on 17 days, and a pretty stiff breeze from N.W. was experienced on 6th. The wet weather delayed the sowing of corn until the last two days of the month, but farm work generally is well advanced. Vegetation is very forward pastures looking exceptionally fresh and green.

JEDBURGH.—The weather was on the whole agreeable. The night temp. was low but that of the day was high. Though a good deal of R fell there was much wind which kept the ground dry and made it fit for sowing. S on the 13th, H T and L on 21st.

COLMONELL.—Mean temp. 44°·1. S showers on 3rd. Strong gale on 16th.

LOCHGILPHEAD, KILMORY.—An exceptionally wet and stormy month for March.

MULL, QUINISH.—An excessively wet and unsettled month the R being almost double the average. Frost on the 12th and 14th, but not severe. Vegetation unusually forward.

BRAEMAR.—A very excellent month. Duration of sunshine 130 hours 20 minutes.

ABERDEEN, CRANFORD.—The month was very dull and cold.

S. RONALDSAY, ROEBERRY.—A wet cold month, Mean temp. 41°·4. A beautiful display of Aurora on the evening of 4th, finest between 10 and 11 o'clock.

IRELAND.

DARRYNANE ABBEY.—A wet cold month, the wettest March registered between 1870–79 and 1890–96. The next wettest was March 1877, when 4·81 in. fell on 22 days.

WATERFORD, BROOK LODGE.—Laurels and blackthorn had a remarkable amount of blossom on them this season. The frost on the 18th and 19th injured the early potatoes which were very forward. H on 1st and 28th, S on 3rd. Thick frosty fog on 22nd.

O'BRIENSBRIDGE, ROSS.—A bad month and the heaviest R since 1882 when 5·76 in. fell.

DUBLIN.—A changeable, wild and very rainy month. Temp. although on the whole markedly above the average was very unstable, and some sharp fluctuations were observed. The mean temp. 46°·1 is 3°·0 above the average. The atmosphere was more or less foggy on 6 days. High winds were noted on 17 days reaching the force of a gale on 10 occasions, S or sleet occurred on 3 days and H fell on 4 days. A solar halo was seen on the 27th and a lunar halo on the 23rd. Brilliant aurora borealis occurred on the night of the 4th.

WARINGSTOWN.—*Correction for February.* In the return for last month ·15 in. measured on March 1st was omitted, leap year being forgotten. The total R should be 1·41 in. and difference from average −1·04.

OMAGH, EDENFEL.—The wettest March since 1868. Let us hope that it will be equally prophetic of the splendid year that then followed.